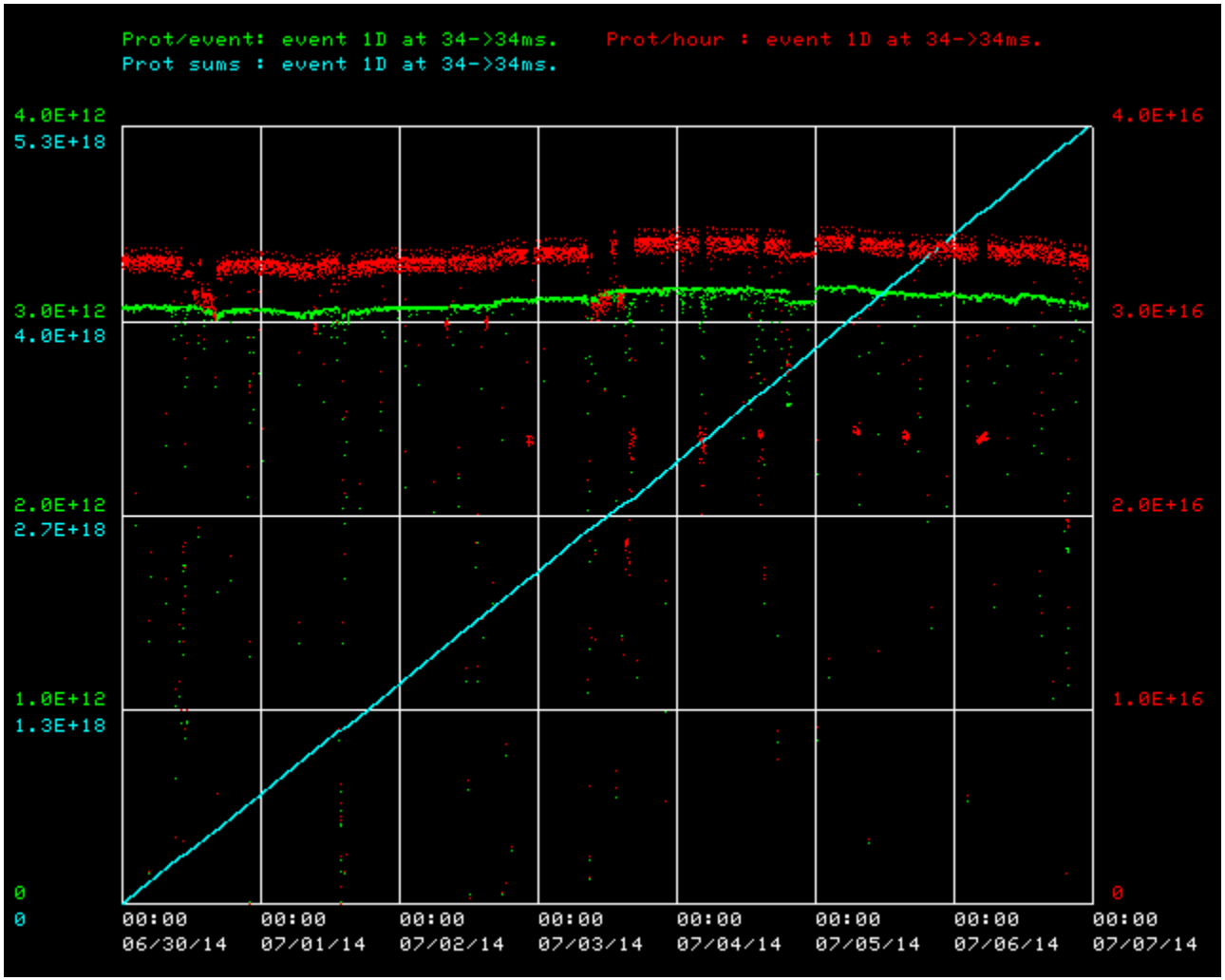
MiniBooNE Beam-Dump Run

Richard Van de Water
LANL

July 7th 2014

BNB

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Summary for Event 1D
From 30-JUN-2014 00:00:00
  to 07-JUL-2014 00:00:00

Percentage up time: 98.9
Total Events:     1761856
Total Protons:    5.34E+18
Average Events/second:        2.94
Average protons/Event:        3.03E+12
Average protons/hour:         3.22E+16
Maximum protons/hour:         3.43E+16  07/03/14
(protons out)/(protons in):   .924
(Joules lost)/(1e12 prot):    12.1

Beam on averages of collected data
Prot/event: event 1D at 34->34ms.  3.06E+12
Prot sums : event 1D at 34->34ms.  2.66E+18
Prot/hour : event 1D at 34->34ms.  3.22E+16
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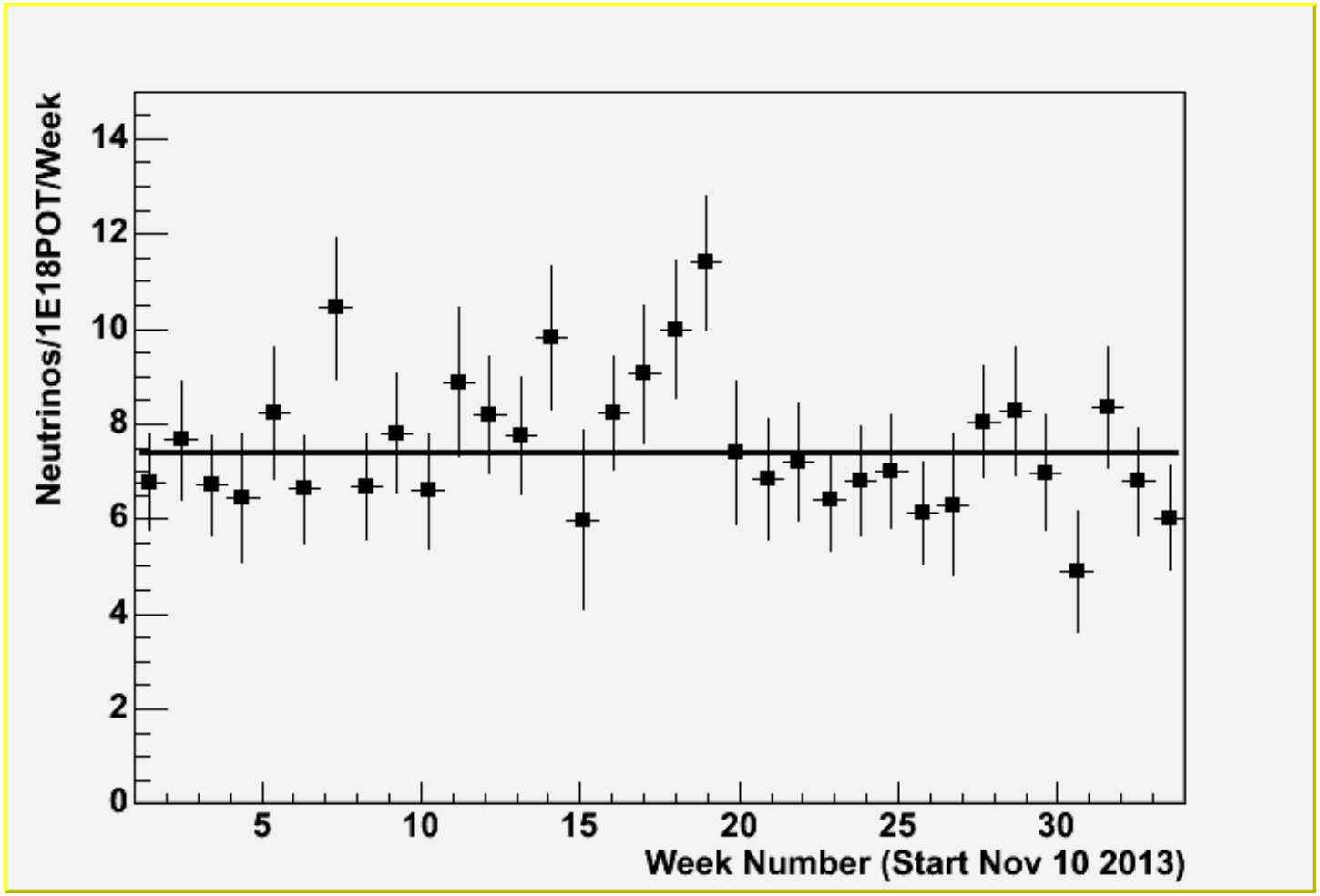
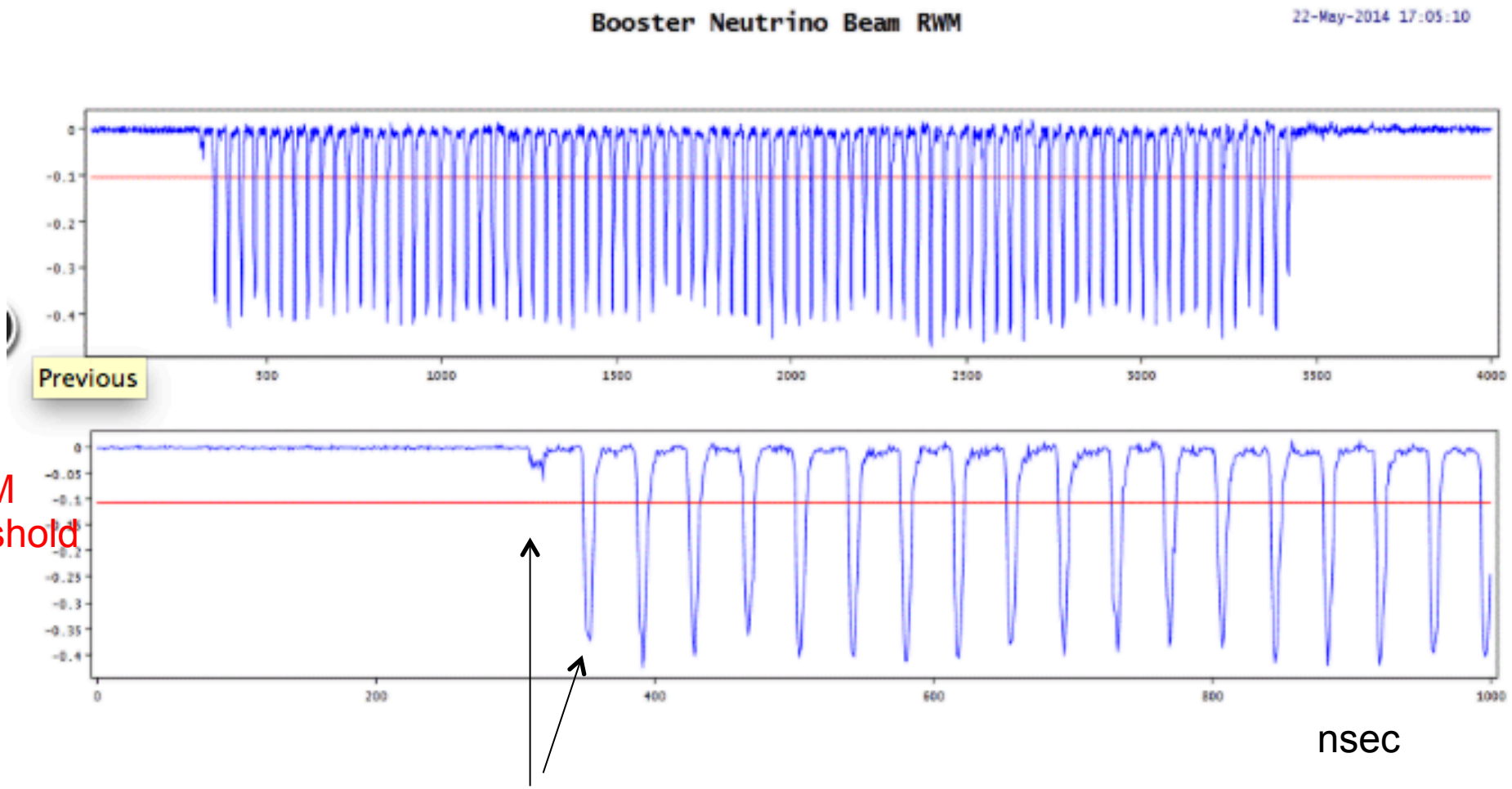
- No major downtimes
- Excellent week

MiniBooNE Detector

- No issues
- 100% uptime

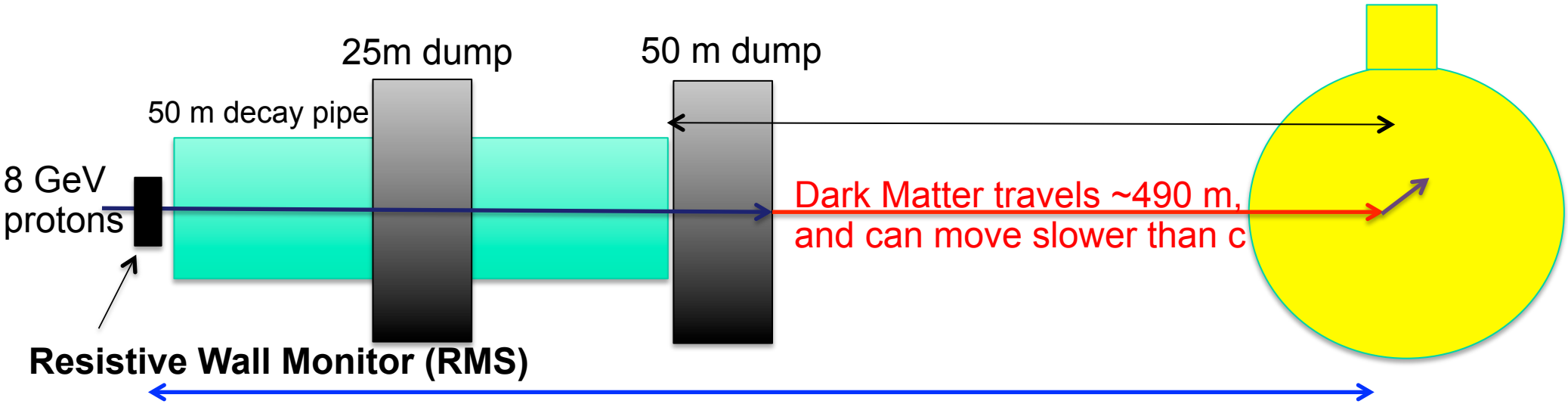


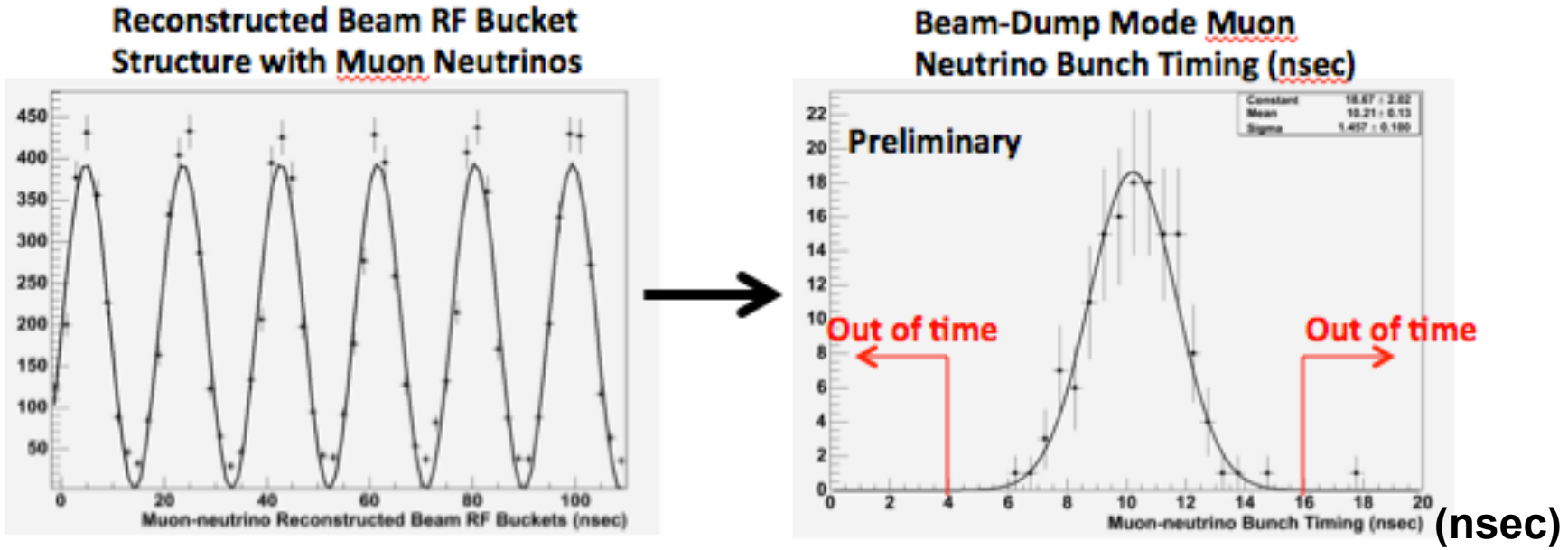
Working with AD to Improve the MiniBooNE Beam Timing



- Our RWM beam timing derived from the first or second pulse discriminator threshold.
- A well defined first or second pulse/bunch will produce stable timing to better than 1 nsec.
- We have found that the first pulse is not always the same size and shape and can mess up good timing, especially if it is un-stable.

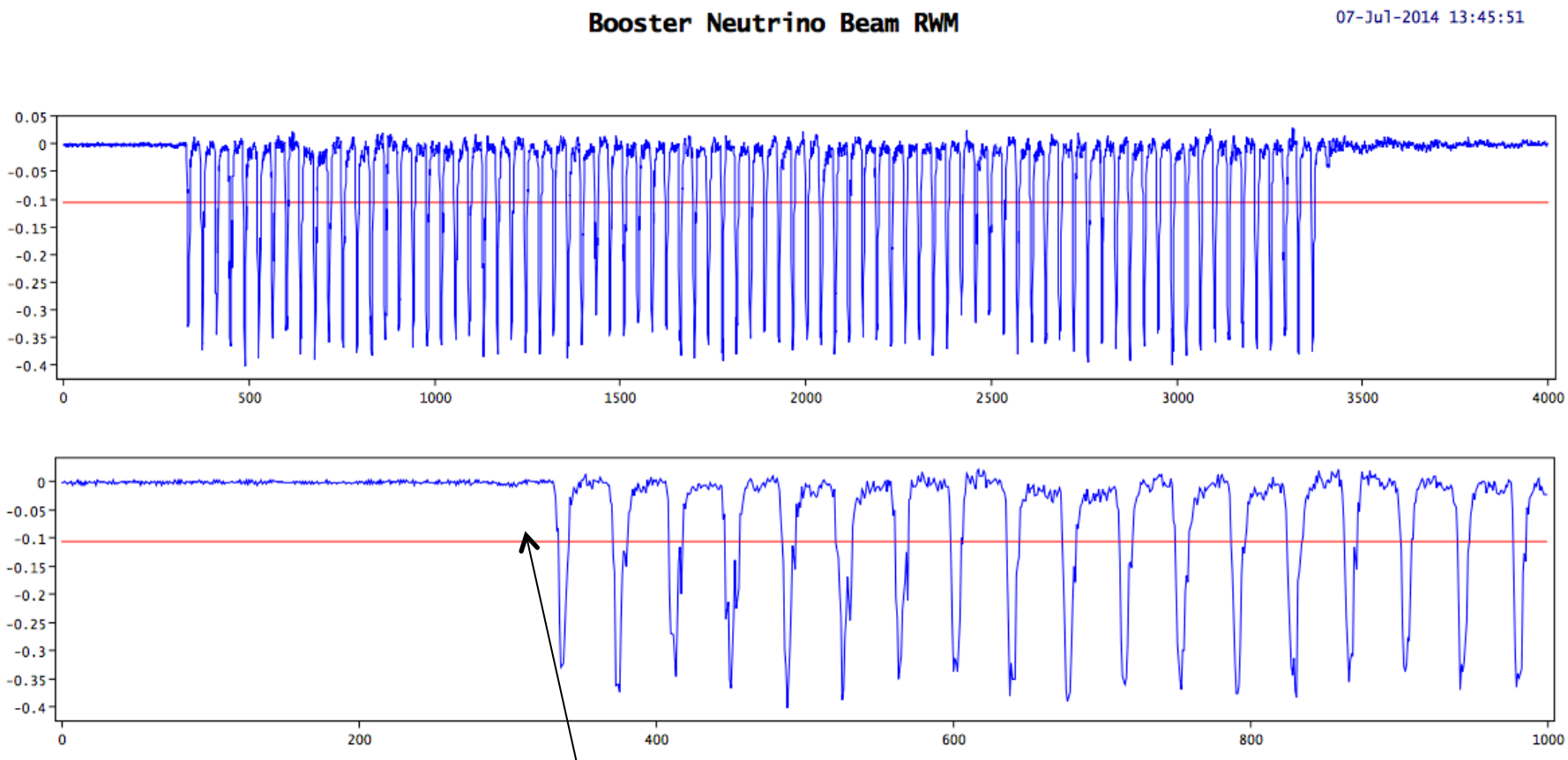
Dark Matter Physics with Good Beam Timing





- When running stable can achieve event T_{RMS} ~ 1.5 nsec timing.
- **This implies timing sensitivity to > 50 MeV Dark Matter**

RWM Timing Improvements

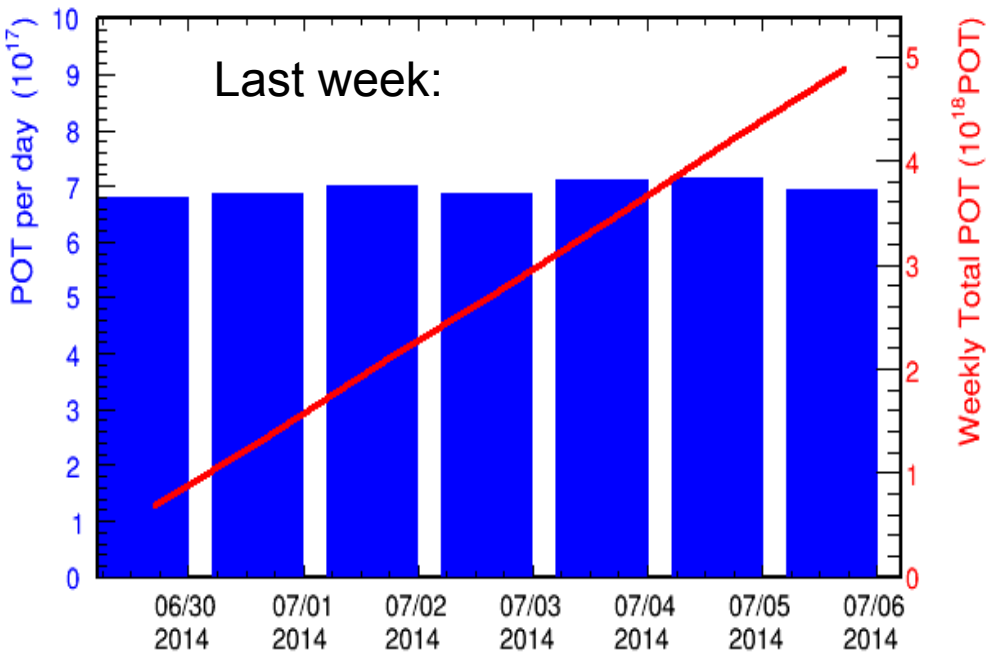


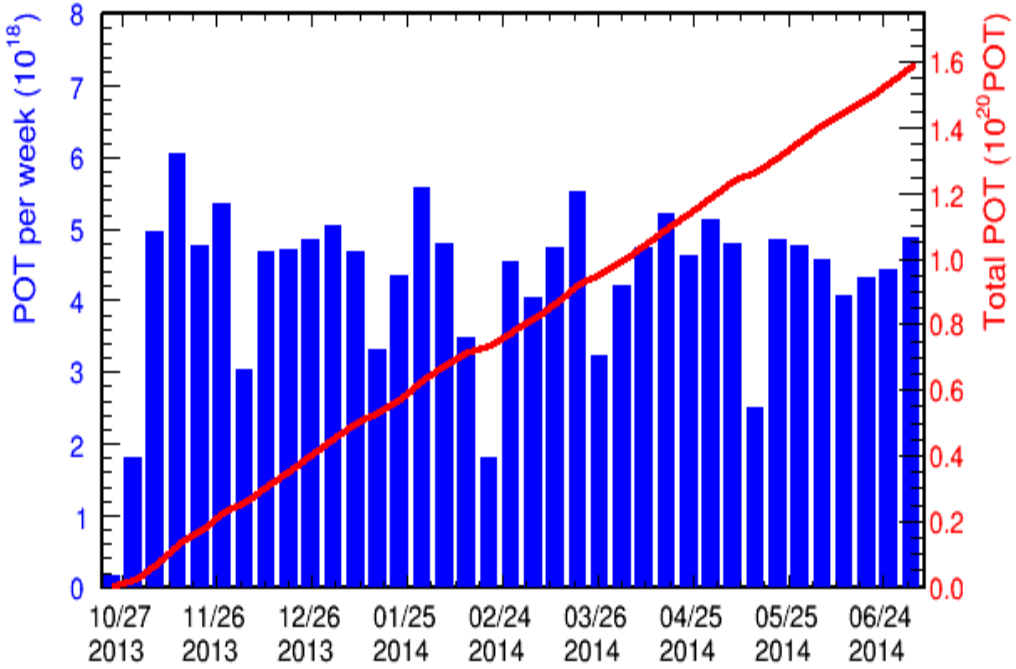
The first (unstable) pulse has been tuned down.

- By tuning the Booster NOKR delay, we are able to ensure that the first pulse is small, and will not interfere with the second stable pulse that is used for timing reference. This has no noticeable effect on Booster losses/operations.
- This has noticeably improved our event timing stability. A big thanks to Mike Backfish, Salah, and rest of AD!

Weekly MiniBooNE Summary

- No issues
- Weekly POT: 5e18
- Total POT: 1.6E20





Outlook to Shutdown

- If we can maintain current ~5e18 POT/week, we should reach a total Beam-Dump run of **~2E20 POT**.
- This surpasses our PAC request for 1.5E20 POT, and will improve our Dark Matter search and systematic tests of the oscillation excess.